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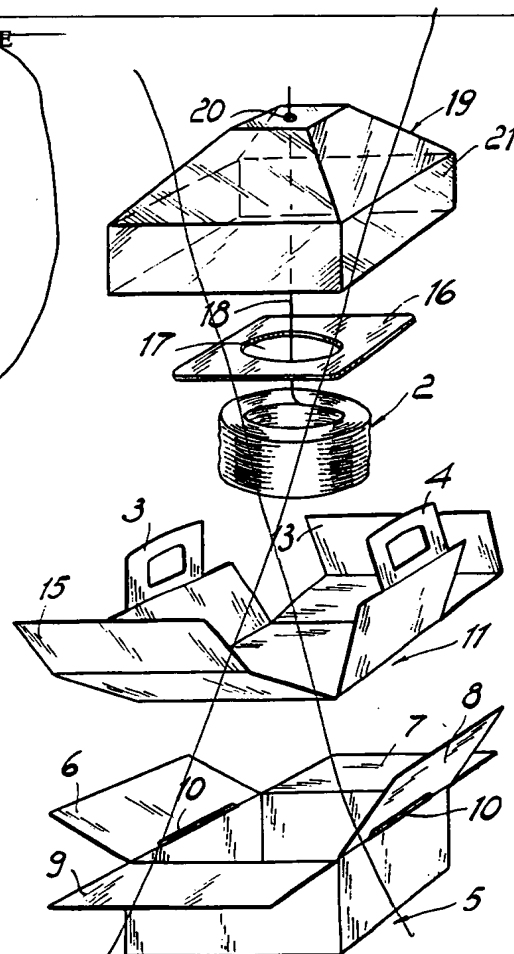
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 5 : B65D 85/04, B65H 49/02		A1	(11) International Publication Number: WO 94/19258
			(43) International Publication Date: 1 September 1994 (01.09.94)
(21) International Application Number: PCT/EP94/00493		(81) Designated States: CA, US, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).	
(22) International Filing Date: 21 February 1994 (21.02.94)			
(30) Priority Data: VR93U000008 23 February 1993 (23.02.93) IT		Published <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>	
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(54) Title: **CONTAINER FOR PACKAGING AND UNWINDING A COIL OF WIRE**

(57) Abstract

Container or box for packaging and unwinding a coil (18) of wire (2), which comprises: a box-like body (5, 11) that has a polygonal plan, can be opened at the top and is meant to accommodate a coil for wire; and a coil covering panel (16) that has a central circular opening (17) and a contour that matches the plan shape of the box-like body, so that it can freely descend within the box-like body in contact with the coil as the height of the coil decreases as the wire is unwound from above through the central opening of the panel, in order to prevent the lifting of turns of wire between the peripheral region of the panel and the container and thus the accidental entanglement of turns.



ABSTRACT

Provided on a separate sheet.

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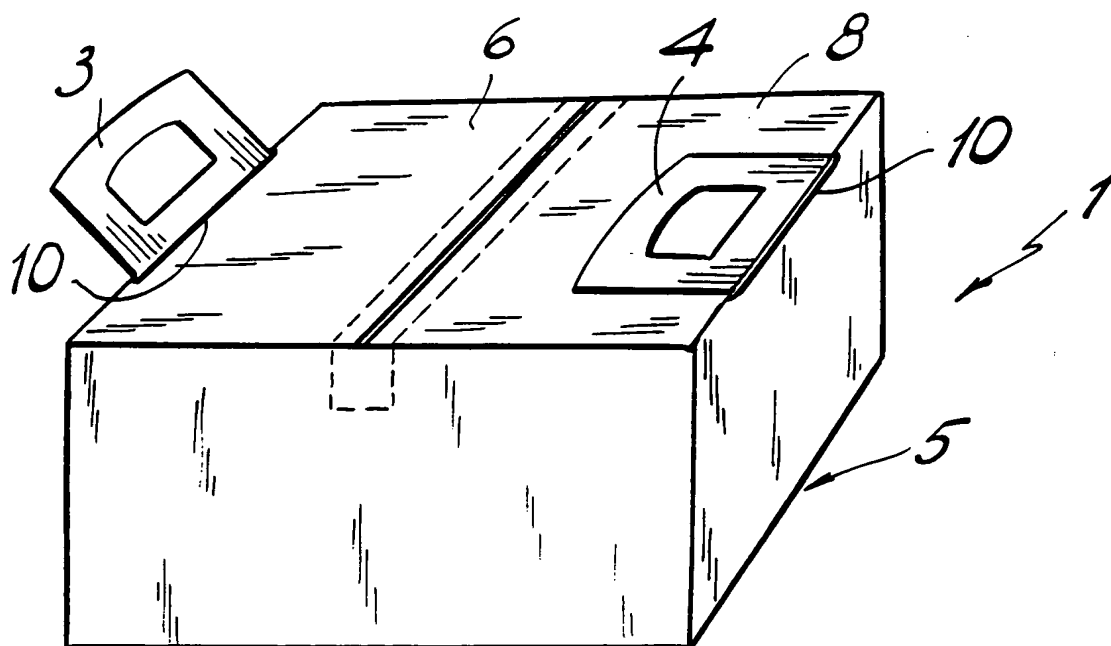


Fig. 1

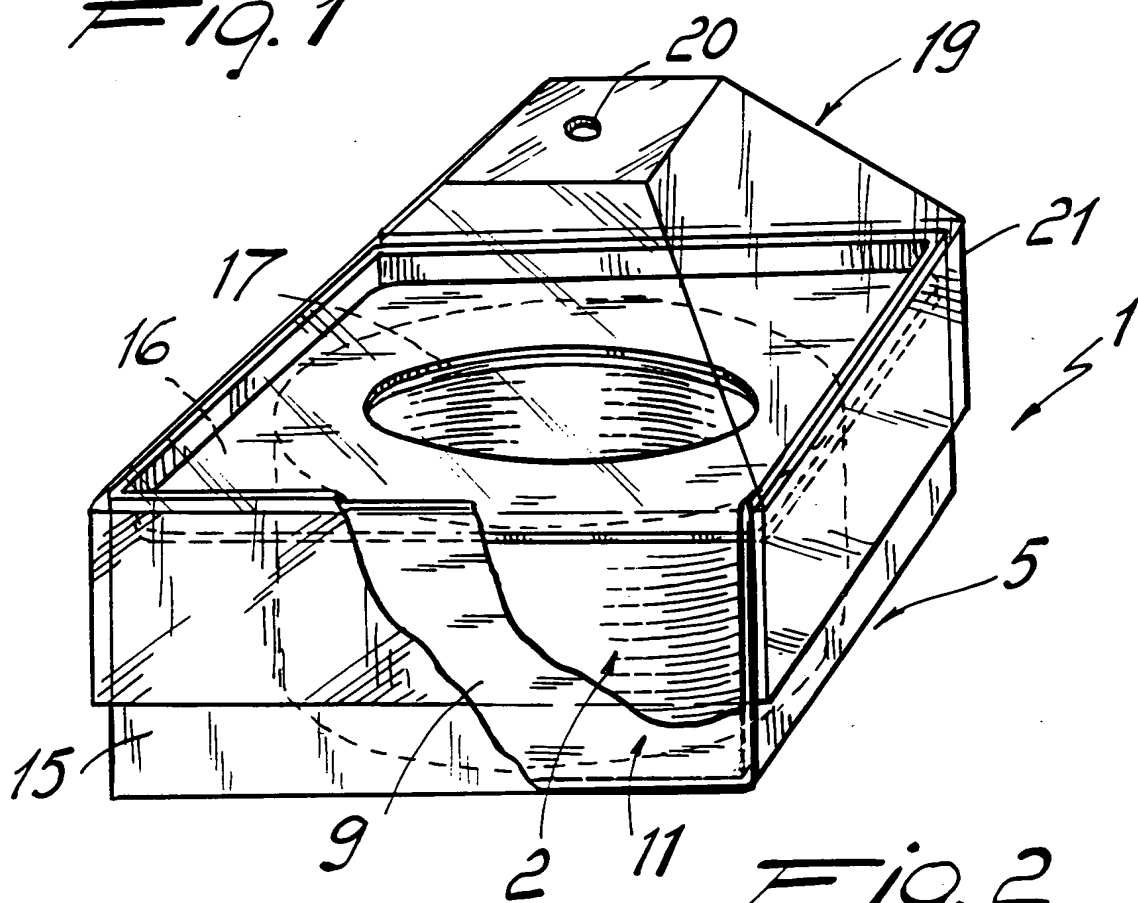


Fig. 2

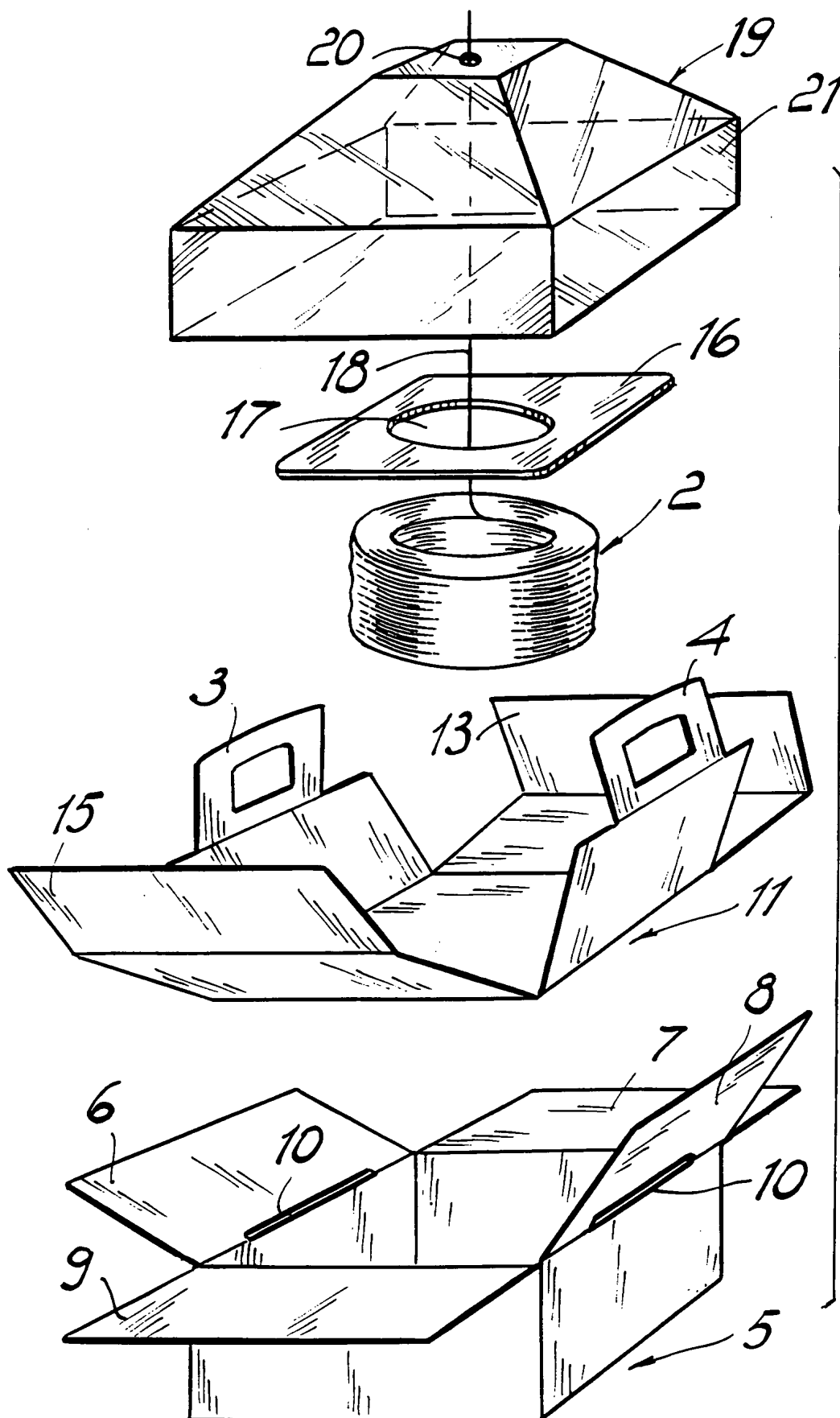
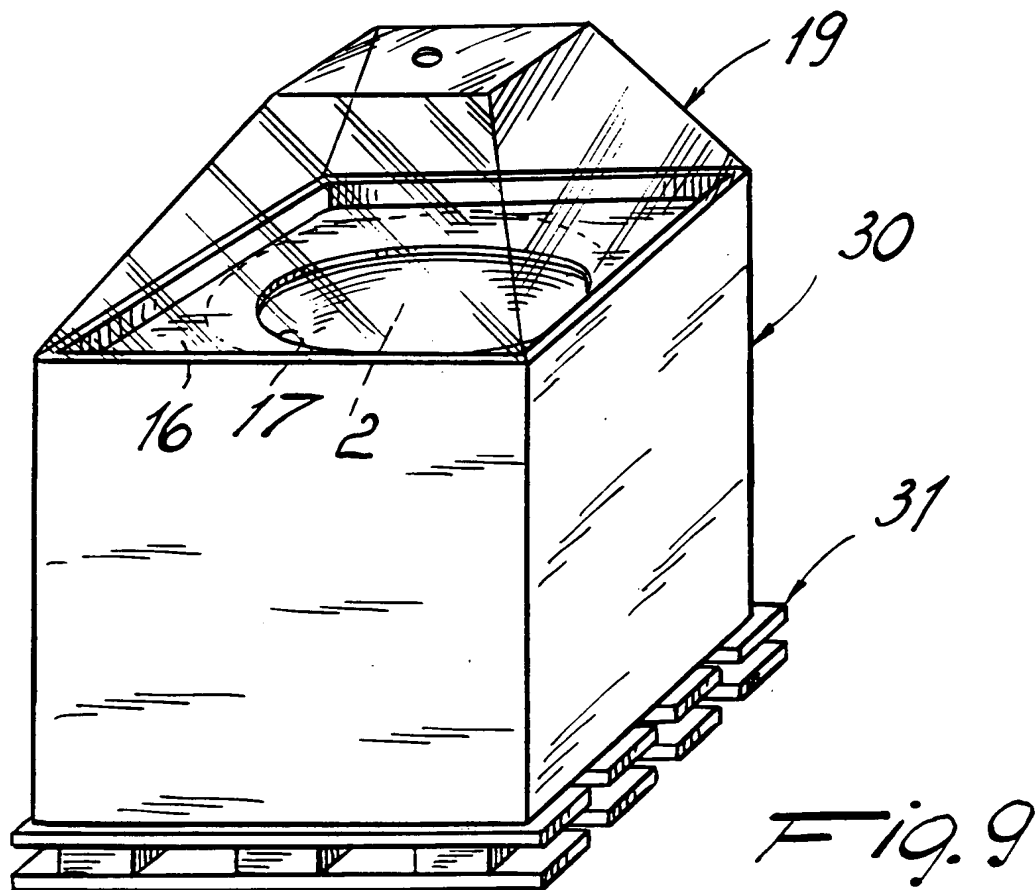
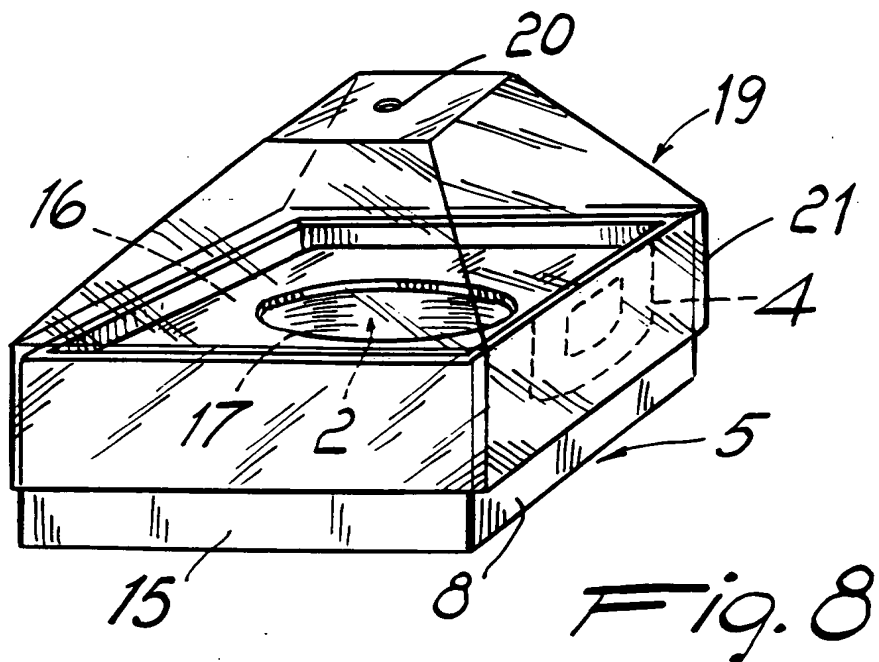


Fig. 3



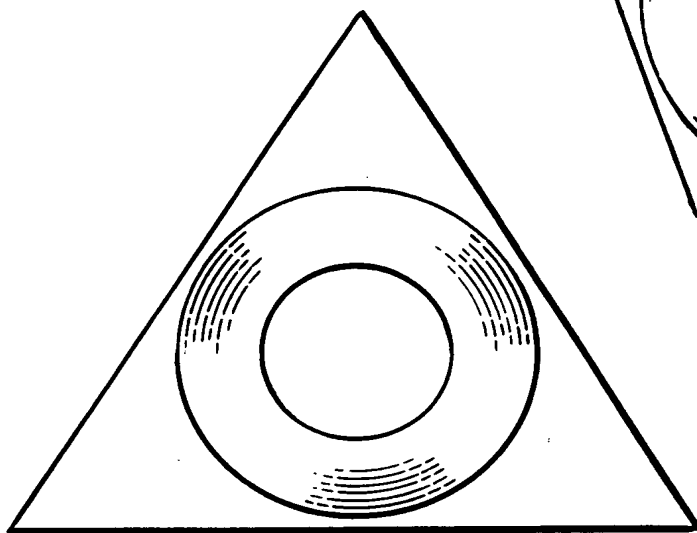


Fig. 10

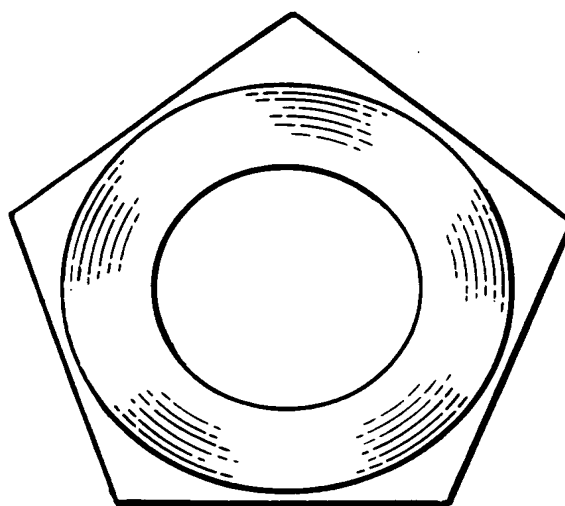


Fig. 11

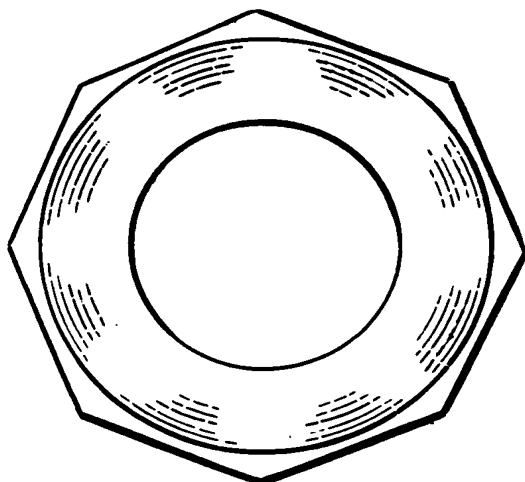


Fig. 13

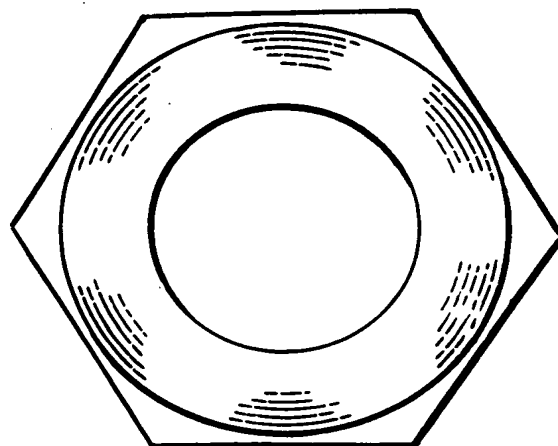
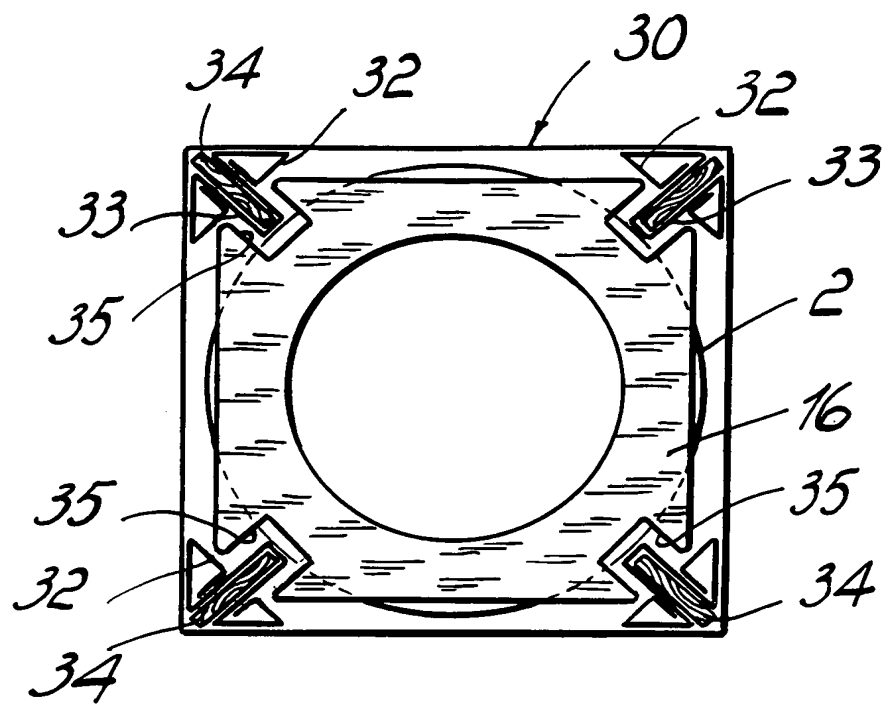
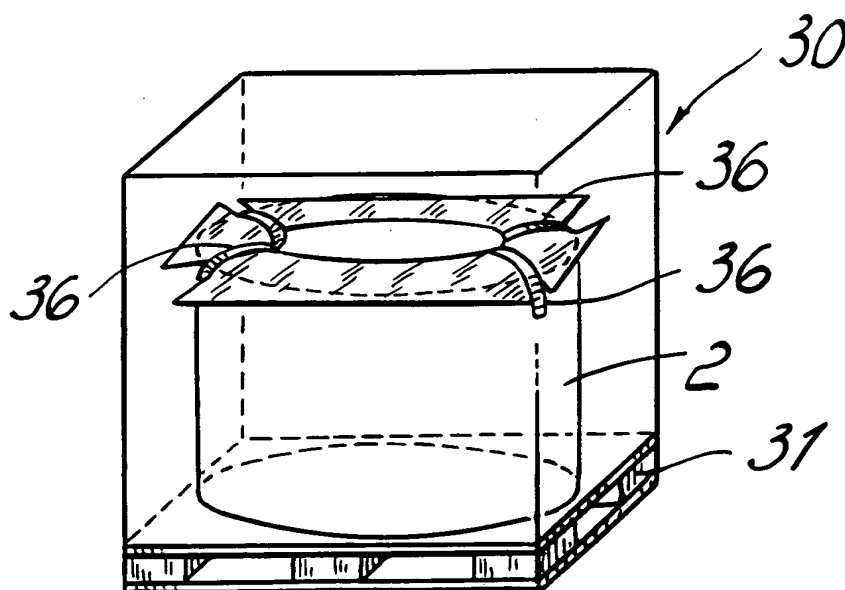


Fig. 12

*Fig. 14**Fig. 15*

Lane HW
3/23/95CONTAINER FOR PACKAGING AND UNWINDING A COIL OF WIRETechnical Field

The present invention relates to a container or box for packaging and unwinding a coil of wire.

Background Art

In unwinding wires, such as soldering wires, from reels or coils there is the problem of unwinding uniformly and uninterruptedly and possibly without forming bumps and without applying undesirable twists to the wire, which would lead to defects or in any case to a reduction in the quality of the soldered joints. A cylindrical container, on which a hood with a wire guiding sheath is placed, has already been proposed for this purpose; in this container, a movable lid or disk is placed above the coil so that it can descend freely as the vertical thickness of the coil decreases; the disk or lid has a smaller diameter than the internal diameter of the container, so as to delimit, together with the inner wall of said container, a gap through which the wire, unwound from the coil passes.

With a container structured in this manner, turns of the wire often escape beyond the movable disk, and since the wire is highly flexible, produce overlaps and form tangles that force to stop the soldering operation that is in progress and entail considerable downtimes to eliminate them and resume soldering.

Disclosure of the Invention

An object of the present invention is to provide a container or box based on a new concept which is suitable for eliminating the drawbacks described above.

Another object of the present invention is to provide a




container or box that allows stacking of a plurality of boxes one on top of the other, so as to allow considerable savings in transport and storage space as well as easy handling.

- 5 Another object of the present invention is to provide a container or box that can be obtained from inexpensive materials and can be disposable.

These objects and others which will become apparent hereinafter are achieved by a container for packaging and
10 unwinding a coil of wire, according to the invention, which comprises: a box-like body that has a polygonal plan, can be opened at the top and is meant to accommodate a coil of wire; and a coil covering panel that has a central circular opening and a contour that matches the plan shape of the
15 box-like body, so that it can freely descend in the box-like body in contact with the coil as the height of said coil decreases as the wire is unwound from above through the central opening of the panel, in order to prevent the lifting of turns of wire between the peripheral region of
20 the panel and the container and thus the accidental entanglement of turns.

Advantageously, the container is constituted by: a first panel made of punched cardboard, which can be folded so as to obtain a first box-like body with multiple closure
25 flaps at its top, two of which have a through slit or slot; by a second panel made of punched cardboard which can be folded into a second box-like body that can be inserted in the first one and has two lateral flaps that are handle-shaped and can be inserted in a respective slit or slot of
30 the first box-like body; and by a coil covering panel, also



made of cardboard, so as to obtain a package which is solid and strong enough, can be easily carried by hand and can be quickly prepared for use simply upon opening it by overturning the top flaps.

Brief Description of the Drawings

5 The invention is described further hereinafter with reference to the accompanying drawings, wherein:

figure 1 is a perspective view of a container that is shaped like a parallelepiped with a square plan and two grip handles for handling it;

10 figure 2 is a perspective view, with parts shown in cross-section, of the container of figure 1;

figure 3 is an exploded and slightly reduced-scale view of the container of figure 2;

figure 4 is a plan view of a coil of wire with four
15 winding "nodes";

figure 5 is a perspective view of an empty open cardboard container;

figure 6 is a view of the container of figure 5, in which a coil of wire has been inserted;


20 figure 7 is a view of the container of figure 6 with a coil covering panel;

figure 8 is a perspective view of the container of figure 7, on which an unwinding hood has been applied;

figure 9 is a perspective view, similar to the view of
25 figure 8, but related to a further embodiment; and

figures 10, 11, 12 and 13 are schematic plan views of further embodiments of the container according to the invention;

figure 14 is a top view of the container of figure 9,



provided with angular inserts and with a modified coil covering panel; and


figure 15 is an axonometric view of the container of figure 14 without the coil covering panel and without the 5 angular elements, but with a coil provided with a plastic strap.

Ways of carrying out the Invention

In the various figures, identical or similar parts or components have been designated by the same reference numerals.

10 Initially with reference to figures 1 to 8, it can be seen that a container according to the invention is formed by a box-like body 1 which has a polygonal plan shape, typically a square one, and can be opened at the *end thereof* top to insert a coil of wire 2, for example soldering wire, in the 15 body. The container 1 has two grip handles 3 and 4 for easier handling and for transport.

More particularly, the container 1 (figure 3) is constituted by: a first panel made of punched cardboard that can be folded so as to obtain a first box-like body 5 with a 20 square plan shape provided with four closure flaps 6, 7, 8 and 9 at its top, two of which -- the flaps 6 and 8 which are not adjacent and are mutually opposite -- have a through slit or slot 10; and by a second panel made of punched cardboard that can be folded into a second inner box-like 25 body 11 that can be accommodated in the box-like body 5 and also has four flaps at its top. Two of the flaps have handles 3 and 4 that can be inserted in the slits or slots 10 provided in the box-like body 5, whereas two other flaps 13 and 15 substantially have the same extension as the



corresponding flaps 7 and 9 of the container 5, so that they can form, after the folding of the flaps for closure and their possible taping to fix them in position, the structure or package shown in figure 1, in which the handles 3 and 4 protrude above the package. These handles, too, can be folded against the package. One thus obtains a package that is sufficiently solid and strong, can be easily carried, even by hand, by one or two operators, and can be quickly prepared for use simply by opening and turning over the top flaps, as will become apparent hereinafter.

Before closing the container 1, a coil covering panel 16 made of light material, preferably cardboard, is placed above the coil 2; said panel has a large central circular opening 17 and a quadrangular contour that matches the plan of the internal empty space of the box-like body 11 but is slightly smaller than said space, so that it can descend freely in the box-like body in contact with the coil as the height of said coil decreases, as the wire 18 is unwound from the top through its central opening 17. The panel 16 has the purpose of preventing the lifting of turns of wire between the outer edge of the panel and the inner container 11. This function is performed particularly by the angular portions of the panel, which act as retention elements for the turns, especially the most peripheral ones. In the absence of a coil covering panel that can follow the decrease in the height of said coil, or if one uses a coil covering panel that has a circular outer contour, as in prior art, some turns rise rather frequently and, under the pulling action of the wire 18 that is being unwound, become entangled, and this entails the need to stop the soldering

operation being performed, with considerable downtimes to restore the feeding of the soldering wire.

In order to prepare the container 1, once it has been moved into its working position proximate to a soldering robot, it is sufficient to break the sealing tape, if any, turn over first the flaps 6 and 8 together with the handles 3 and 4 and then the flaps 7 and 9 together with the flaps 13 and 15, as shown in figures 2 and 8, and then apply a hood 19, preferably made of transparent material so as to allow also visual inspection of the progress of the unwinding of the coil 2. A wire guiding sheath, not shown in the drawings, is fixed in a central position, as shown by 20, at the top of said hood. The hood 19 is like a frustum-shaped pyramid with a base 21 that has the same plan shape as the container 1 and is slightly larger so that it can fit over its overturned flaps.

Advantageously, the coil 2 is not wound in circular turns but in groups of slightly elliptical turns with a major axis that moves sequentially, for example through 90° for each successive group of turns, as generally shown in figure 3. Furthermore, during formation of the coil the wire is pre-twisted, for example so as to produce, during its unwinding, a complete twist of the wire only after every portion of a preset length, for example every 15 meters (minimum) or even every 30 m, so that the wire unwinds straight, without bends, bumps or twists which would otherwise occur if the coil were formed according to conventional methods.

Once the entire coil has been used, the hood 19 is recovered for other uses, whereas the container 1 as a whole

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is disposable and can in any case be rapidly replaced and removed from the working position to be discarded.

The container 1 can be typically meant to contain coils of wire of up to approximately 230 kg. For coils weighing 5 over 200 kg it is possible to use a container 30 that has a square plan and is made of wood-fiber composite panels or plywood, such as the one shown in figure 9, which if desired can be nailed or glued to a pallet 31 (for example made of cardboard or wood) for transport.

10 Figures 10 to 13 illustrate other possible embodiments of a container 1 or 30 for coils obtained with elliptical turns *with the major axes* ~~that are~~ offset respectively by 120° , 72° , 60° and 45° instead of by 90° as with the container 1. *See a1*

Especially when dealing with rather heavy coils 2, 15 weighing for example around 450 kg, it is convenient to make the pallet 31 out of wood and to provide angular elements 32, for example made of cardboard, at the inner corners; each angular element delimits a longitudinal seat 33 in which it is possible to accommodate a wood board or strip 34 20 which lies radially with respect to the coil. In this case, the panel with the coil has angular notches 35, each meant to partially and loosely accommodate a respective strip 34.

With this arrangement, during transport or stacking in store one avoids outward deformations of the coil 2. 25 Furthermore, during soldering, when the wire is unwound from the coil 2 and the height of said coil decreases, the panel 16 can easily descend, sliding unhindered along the strips 34.

In order to prevent part of the upper turns of the coil 30 from rising and arranging themselves in a disorderly fashion

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during transport on road vehicles due to the unavoidable vibrations because said turns are not subjected to any load, it is possible to use plastic straps 36 that bind together a bundle of turns of said coil.

- 5 The above described packaging container is susceptible to numerous modifications and variations all of which are within the protective scope defined by the content of the claims that follow.

9

CLAIMS

INS a2

1 1. Container for packaging and unwinding a coil (18) of
2 wire (2), which comprises: a box-like body (1) that has a
3 polygonal plan, can be opened at the top and is meant to
4 accommodate a coil of wire; and a coil covering panel (16)
5 that has a central circular opening (17) and a contour that
6 matches the plan shape of the box-like body, so that it can
7 freely descend in the box-like body in contact with the coil
8 as the height of said coil decreases as the wire is unwound
9 from above through the central opening of the panel, in
10 order to prevent the lifting of turns of wire between the
11 peripheral region of the panel and the container and thus
12 the accidental entanglement of turns.

1 2. Container according to claim 1, characterized in
2 that said container (1) and said coil covering panel (16)
3 have a polygonal plan shape.

1 3. Container according to claim 1 or 2, characterized
2 in that it comprises a pair of handles (3,4) for its manual
3 handling and transport.

1 4. Container according to any one of the preceding
2 claims, characterized in that it comprises: a first panel
3 made of punched cardboard, that can be folded so as to
4 obtain a first box-like body (5) with multiple closure flaps
5 (6-9) at its top, two of said flaps having a through slit
6 (10) or slot; a second panel made of punched cardboard, that
7 can be folded so as to obtain a second box-like body (11)
8 that can be inserted in the first one and has two lateral
9 flaps that are shaped like handles (3,4) and can be inserted
10 in a respective slit or slot of the first box-like body; and

11 a coil covering panel (16) which is also made of cardboard.

1 5. Container according to any one of the preceding
2 claims, characterized in that said coil (2) has elliptical
3 turns arranged in groups, each group having its major axis
4 orientated at right angles to a respective wall of the
5 container.

1 6. Container according to claim 4, characterized in
2 that it comprises a wire unwinding hood (19) that is like a
3 frustum-shaped pyramid with a polygonal base (21) and can be
4 inserted on the container.

1 7. Container according to any one of the preceding
2 claims, characterized in that it comprises angular elements
3 (32) for confining the coil.

1 8. Container according to claim 7, characterized in
2 that each one of said angular elements delimits a
3 longitudinal recess (33) and comprises a removable insert
4 (34) for abutment against the coil.

1 9. Container according to claim 8, characterized in
2 that said angular elements are made of cardboard and that
3 said insert is a wood strip.

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CONTAINER FOR PACKAGING AND UNWINDING A COIL OF WIRE

ABSTRACT

Container or box for packaging and unwinding a coil of wire, which comprises: a box-like body that has a polygonal plan, can be opened at the top and is meant to accommodate a coil of wire; and a coil covering panel that has a central
5 circular opening and a contour that matches the plan shape of the box-like body, so that it can freely descend within the box-like body in contact with the coil as the height of the coil decreases as the wire is unwound from above through the central opening of the panel, in order to prevent the
10 lifting of turns of wire between the peripheral region of the panel and the container and thus the accidental entanglement of turns.

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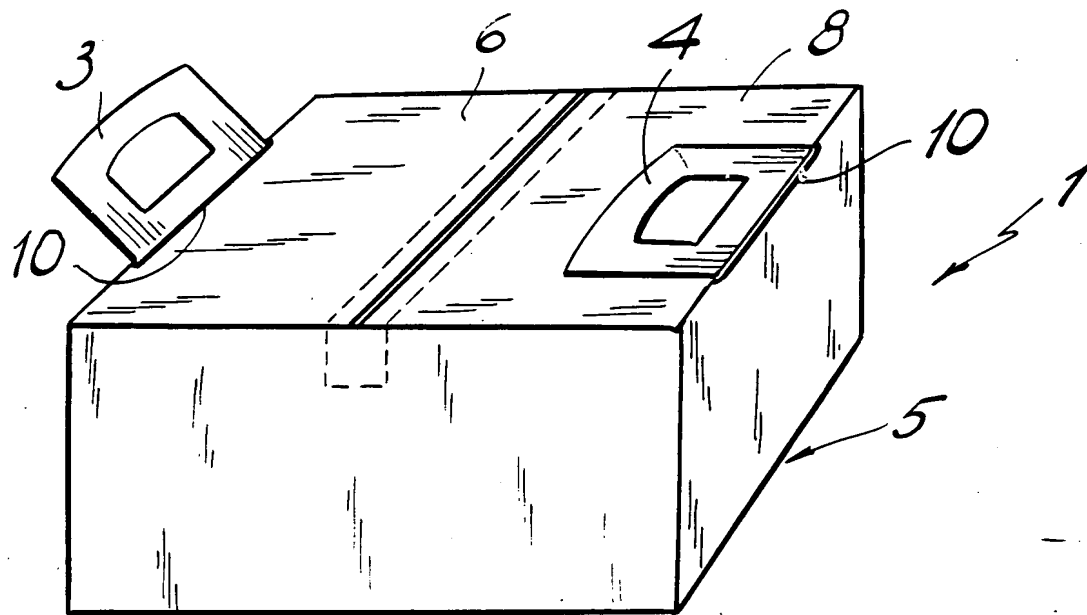


Fig. 1

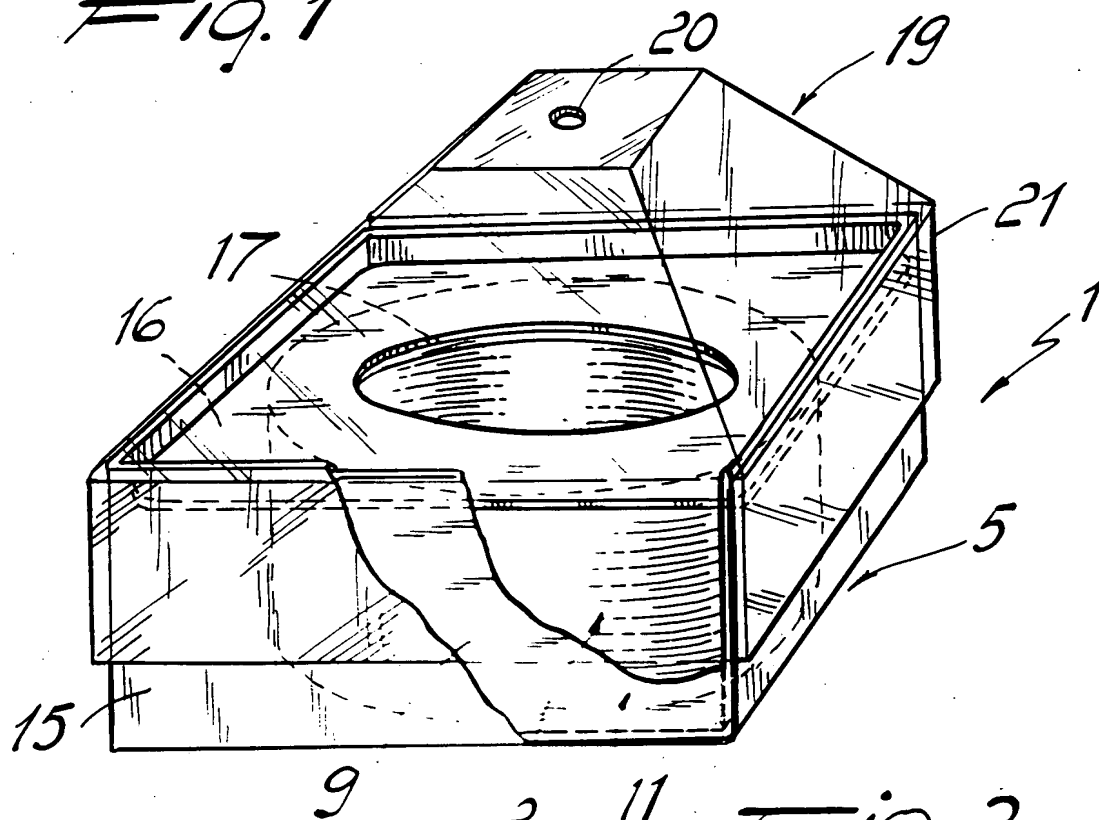


Fig. 2

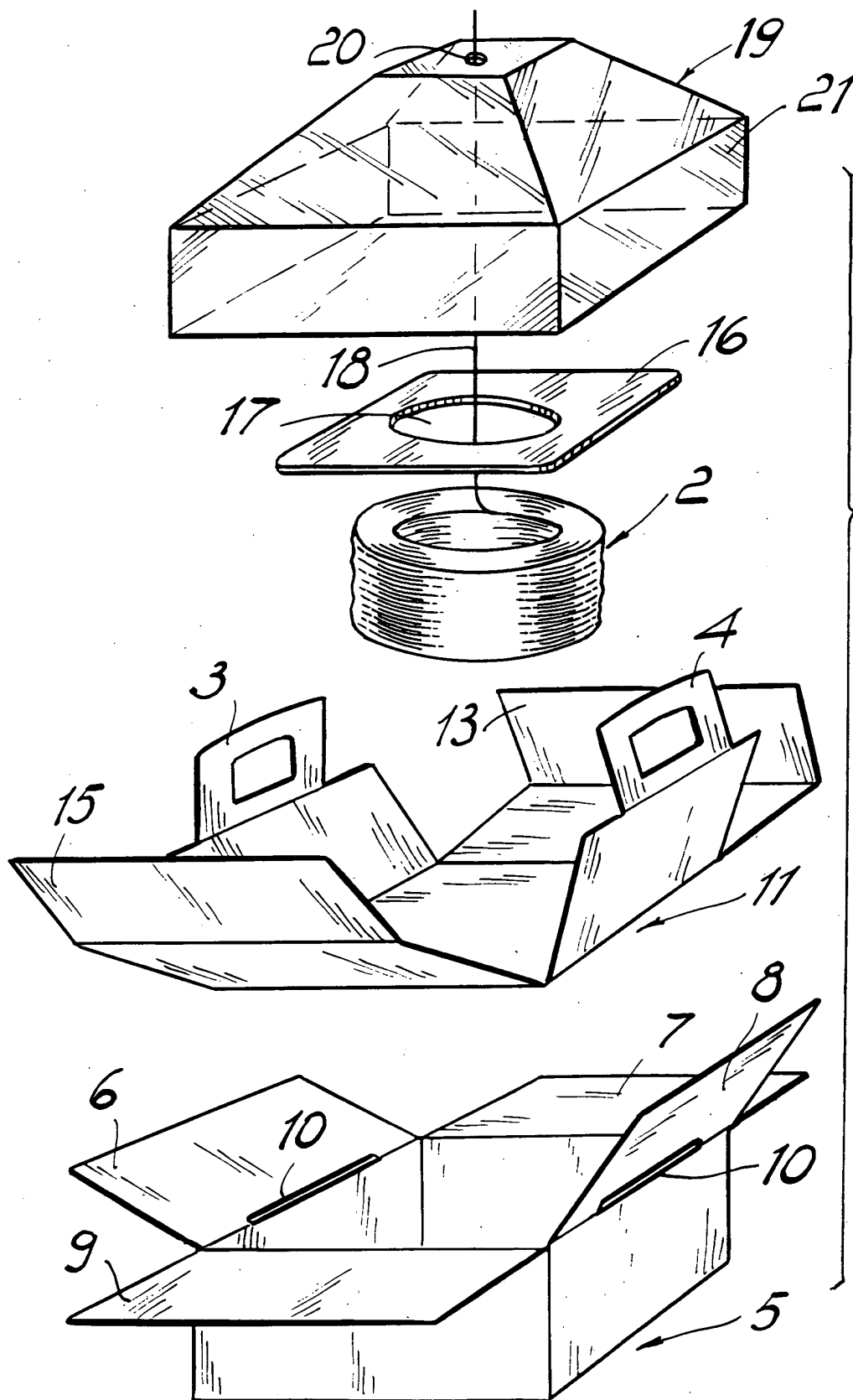
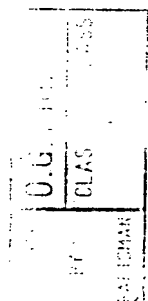


Fig. 3

Fig. 4

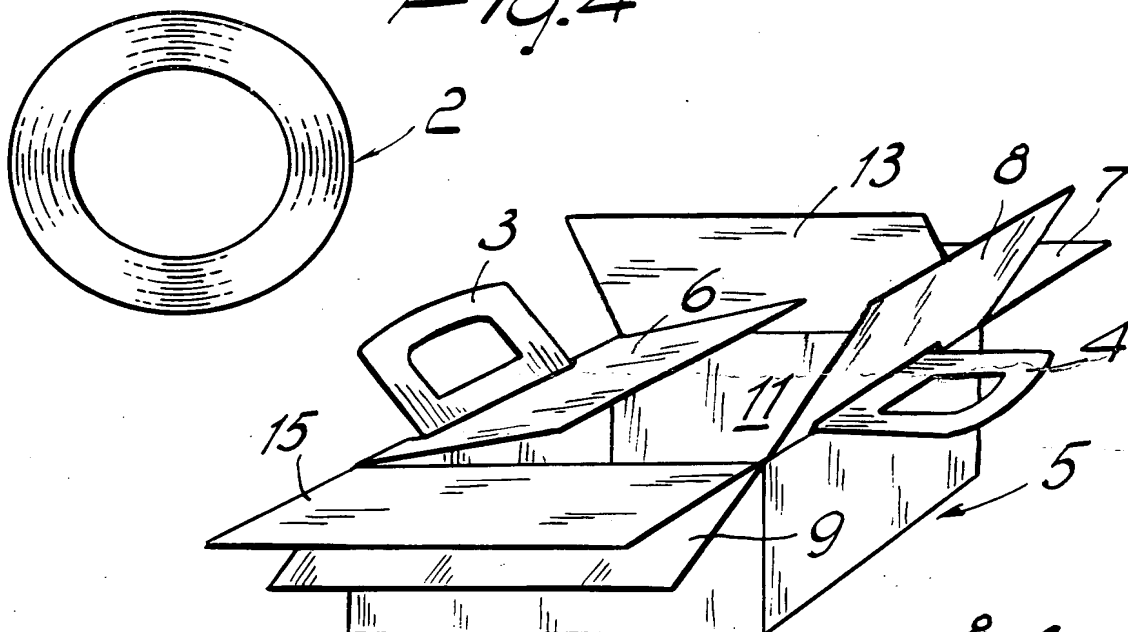


Fig. 5

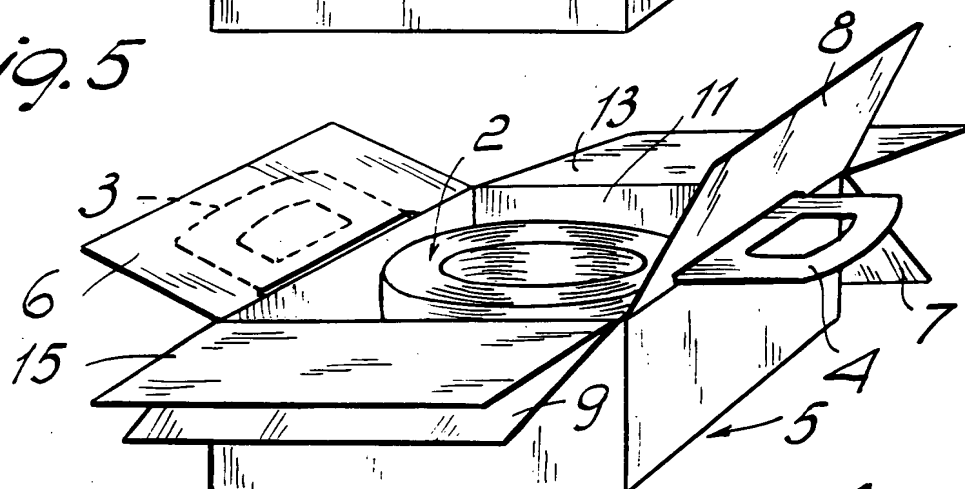


Fig. 6

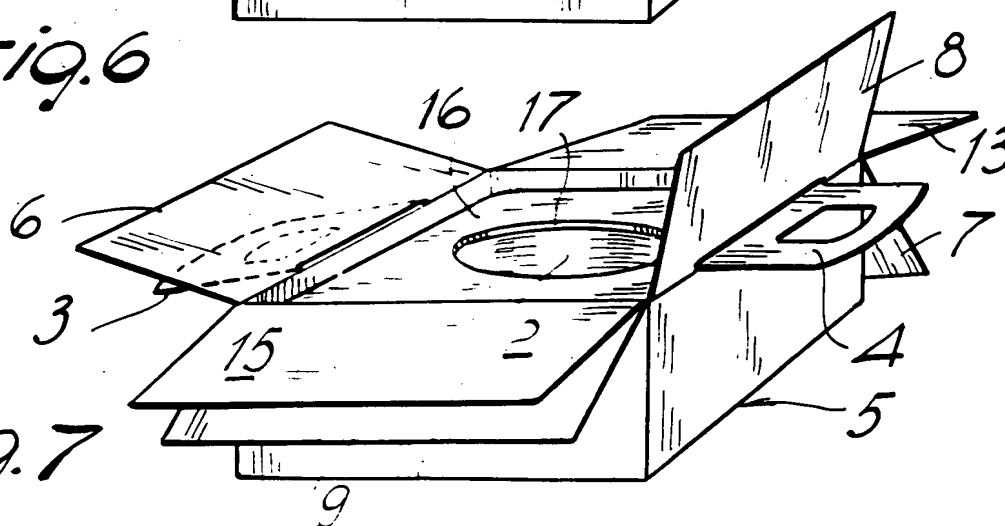
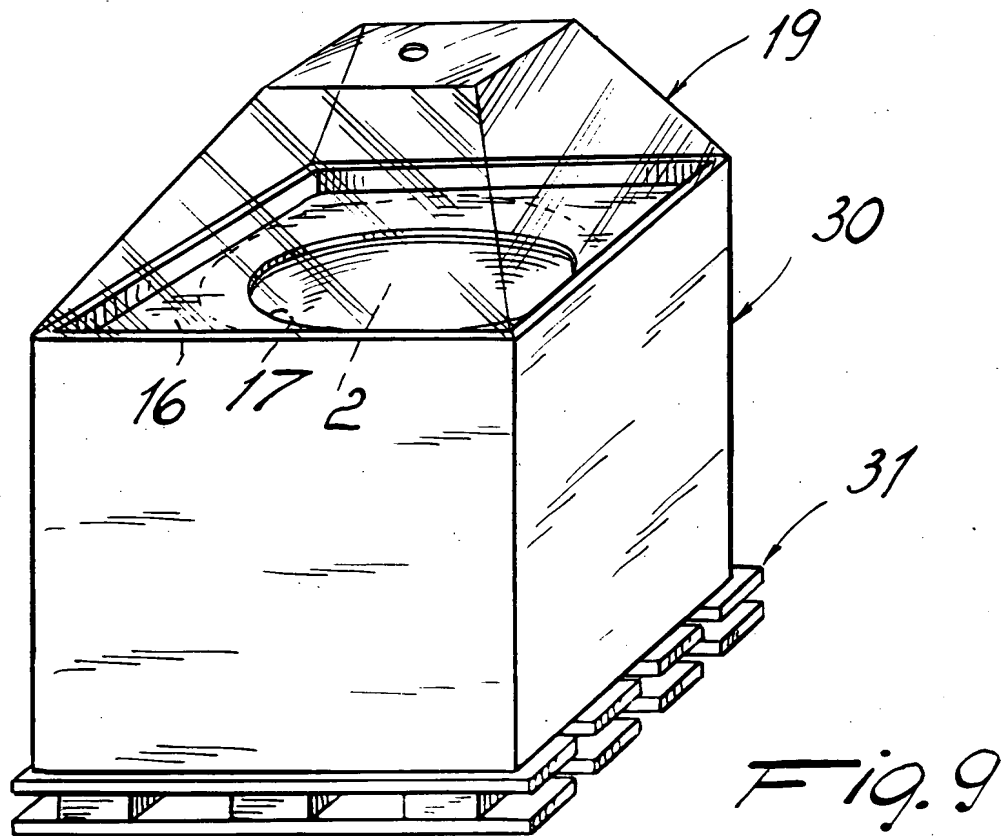
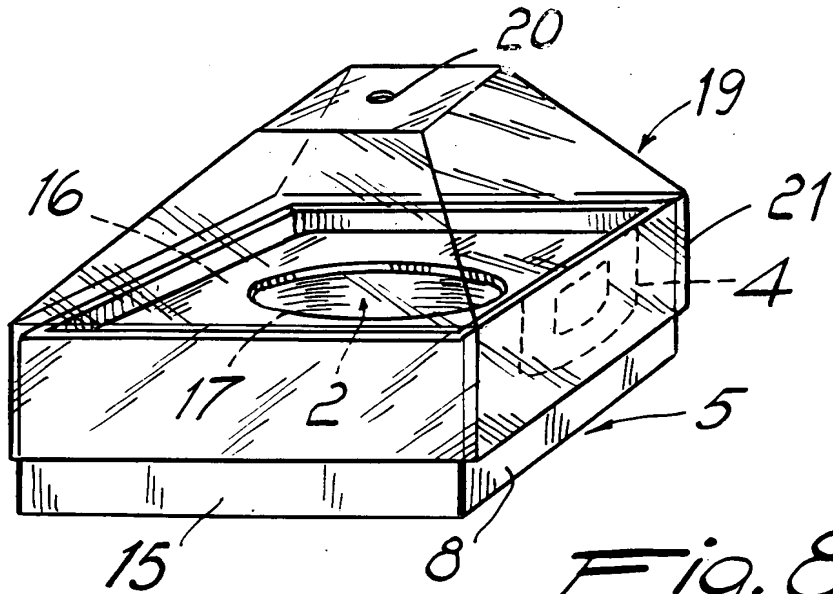


Fig. 7

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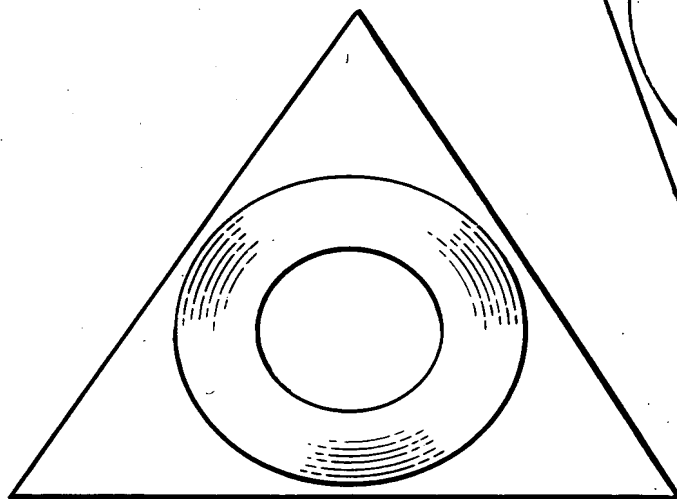


Fig. 10

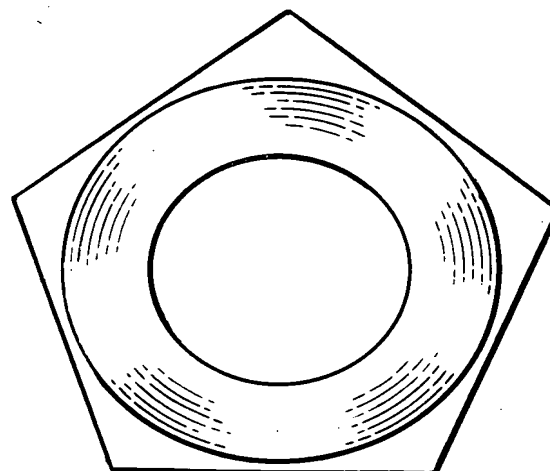


Fig. 11

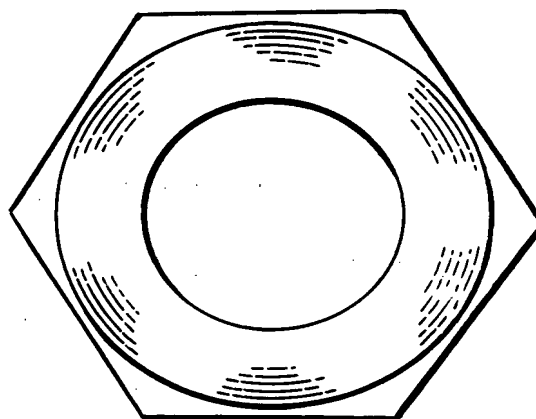


Fig. 12

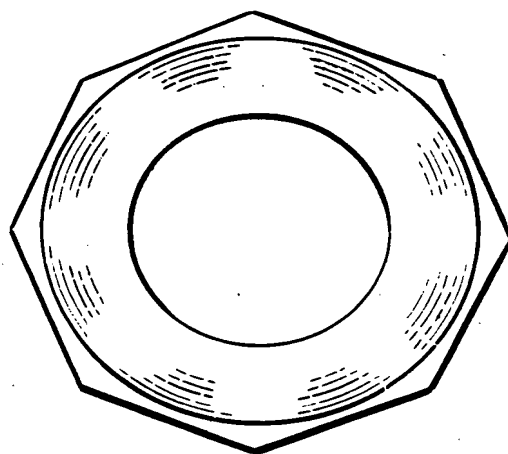


Fig. 13

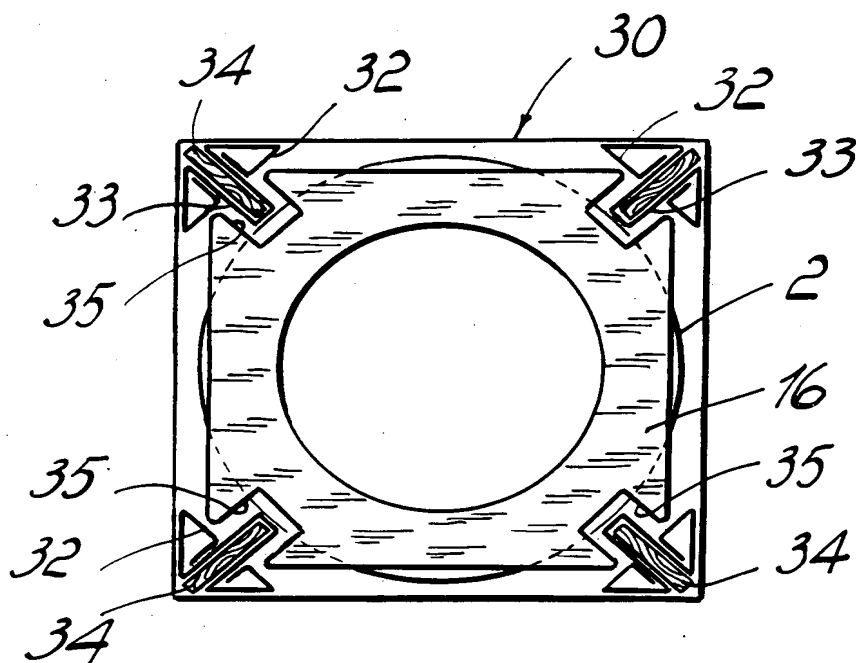


Fig. 14

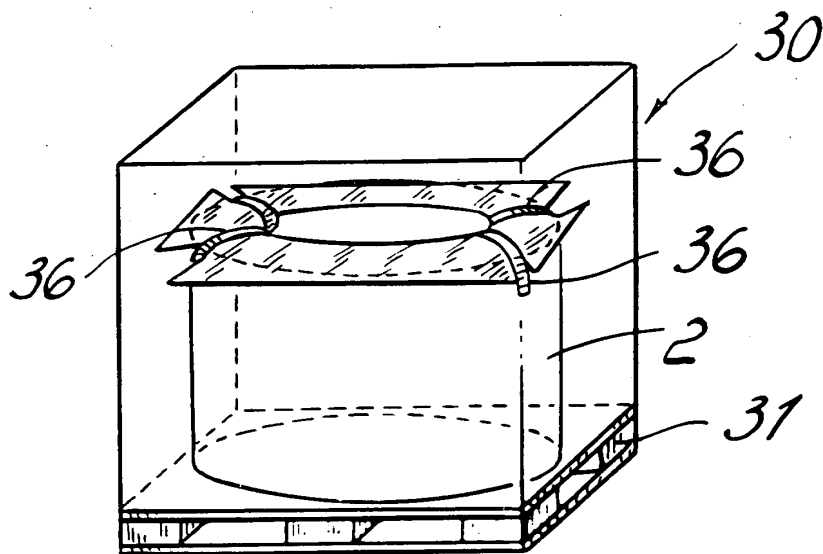


Fig. 15

PATENT COOPERATION TREATY

⑨

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PCT

NOTIFICATION CONCERNING
SUBMISSION OF PRIORITY DOCUMENTS

(PCT Administrative Instructions, Section 411)

To:

MODIANO, Guido
Modiano & Associati
Via Meravigli, 16
I-20123 Milan
ITALIE

Date of mailing:

14 April 1994 (14.04.94)

Applicant's or agent's file reference:

26240/GM/sd

IMPORTANT NOTIFICATION

International application No.:

PCT/EP94/00493

International filing date:

21 February 1994 (21.02.94)

Priority date:

23 February 1993 (23.02.93)

Applicant:

SIDERGAS S.R.L. et al

The applicant is hereby notified of the date of receipt by the International Bureau of the priority document(s) relating to the following application(s):

Priority application No.:

VR93U000008

Priority date:

23 Feb 1993 (23.02.93)

Priority country:

IT

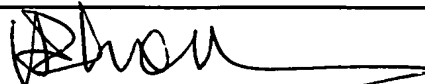
Date of receipt of priority document:

14 Apr 1994 (14.04.94)

The International Bureau of WIPO
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1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorised officer:



H. Zhou

Telephone No.: (41-22) 730.91.11

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

To:
MODIANO & ASSOCIATI
Attn. Modiano, Guido
Via Meravigli 16
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ITALY

NOTIFICATION OF RECEIPT
OF SEARCH COPY

(Pct Rule 25.1)

Date of mailing
(day/month/year) 11/04/94

Applicant's or agent's file reference
26240/GM/sd

IMPORTANT NOTIFICATION

International application No.
PCT/EP 94/00493


International filing date(day/month/year)
21/02/94

(Priority date)
(day/month/year) 23/02/93

Applicant
SIDERGAS S.r.l. et al.

1. Where the International Searching Authority and the receiving Office are not the same Office:
- The applicant is hereby notified that the search copy of the international application was received by this International Searching Authority on the date indicated below.
- Where the International Searching Authority and the receiving Office are the same Office:
- The applicant is hereby notified that the search copy of the international application was received on the date indicated below.
- 18/03/94 (date of receipt).
2. Time limit for establishment of international search report
- The applicant is informed that the time limit for establishing the international search report is 3 months from the date of receipt indicated above or 9 months from the priority date, whichever time limit expires later
3. A copy of this notification has been sent to the International Bureau and, where the first sentence of paragraph 1 applies, to the receiving Office.

Name and mailing address of the International Searching Authority

 European Patent Office, P.B. 5818 Patentlaan 2
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PATENT COOPERATION TREATY

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To:

MODIANO, Guido
Modiano & Associati
Via Meravigli, 16
I-20123 Milan
ITALIE

Date of mailing: 23 March 1994 (23.03.94)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference: 26240/GM/sd	International application No.: PCT/EP94/00493

The applicant is hereby notified that the International Bureau has received the record copy of the international application as detailed below.

Name(s) of the applicant(s) and State(s) for which they are applicants:

SIDERGAS S.R.L. (for all designated States except US)
GELMETTI, Carlo (for US)

International filing date : 21 February 1994 (21.02.94)

Priority date(s) claimed : 23 February 1993 (23.02.93)

Date of receipt of the record copy
by the International Bureau : 22 March 1994 (22.03.94)

Designated Offices which will be notified
of the receipt of the record copy : CA,EP*,US
* AT,BE,CH,DE,DK,ES,FR,GB,GR,IE,IT,LU,MC,NL,PT,SE

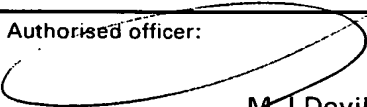
ATTENTION

The applicant should carefully check the data appearing in this Notification. In case of any discrepancy between these data and the indications in the international application, the applicant should immediately inform the International Bureau.

In addition, the applicant's attention is drawn to the information contained in the Annex, relating to:

- ☒ time limits for entry into the national phase;
- ☒ confirmation of precautionary designations;
- ☒ requirements regarding priority documents.

A copy of this Notification is being sent to the receiving Office and to the International Searching Authority.

<p>The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland</p> <p>Facsimile No. (41-22) 740.14.35</p>	<p>Authorised officer:</p> <p> M. J. Devillard</p> <p>Telephone No. (41-22) 730.91.11</p>
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INFORMATION ON TIME LIMITS FOR ENTERING THE NATIONAL PHASE

The applicant is reminded that the "national phase" must be entered before each of the designated Offices indicated in the Notification of Receipt of Record Copy (Form PCT/IB/301) by paying national fees and furnishing translations, as prescribed by the applicable national laws.

The time limit for performing these procedural acts is **20 MONTHS** from the priority date or, for those designated States which the applicant elects in a demand for international preliminary examination or in a later election, **30 MONTHS*** from the priority date, provided that the election is made before the expiration of 19 months from the priority date. Some designated (or elected) Offices have fixed time limits which expire even later than 20 or 30 months from the priority date. In other Offices an extension of time or grace period, in some cases upon payment of an additional fee, is available.

In addition to these procedural acts, the applicant may also have to comply with other special requirements applicable in certain Offices. **It is the applicant's responsibility** to ensure that the necessary steps to enter the national phase are taken in a timely fashion. Most designated Offices do not issue reminders to applicants in connection with the entry into the national phase.

For detailed information about the procedural acts to be performed to enter the national phase before each designated Office, the applicable time limits and possible extensions of time or grace periods, and any other requirements, see the relevant Chapters of Volume II of the PCT Applicant's Guide. Information about the requirements for filing a demand for international preliminary examination is set out in Chapter IX of Volume I of the PCT Applicant's Guide.

Note that since CH/LI, ES and GR are not bound by PCT Chapter II (which provides for the international preliminary examination procedure), those States cannot be elected in a demand for international preliminary examination. In the case of designations of CH/LI or ES for a national patent, the applicant must thus always enter the national phase before the national Offices of those States before the expiry of 20 months from the priority date. In the case of designations of CH/LI, ES or GR for a European patent, however, the 31-month time limit applies in respect of those designations if at least one other State designated for a European patent is elected within the 19-month period.

Note also that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

- * With respect to Poland, a translation into Polish must always be furnished within 20 months from the priority date **where those 20 months expire before 1 March 1994**, even if Poland was elected for international preliminary examination before the expiration of 19 months from the priority date. Where those 20 months expire on or after 1 March 1994, the translation into Polish must be furnished, if Poland was elected for international preliminary examination before the expiration of 19 months from the priority date, before the expiration of 30 months from the priority date.

CONFIRMATION OF PRECAUTIONARY DESIGNATIONS

This notification lists only specific designations made under Rule 4.9(a) in the request. It is important to check that these designations are correct. Errors in designations can be corrected where precautionary designations have been made under Rule 4.9(b). The applicant is hereby reminded that any precautionary designations **may** be confirmed according to Rule 4.9(c) before the expiration of 15 months from the priority date. If it is not confirmed, it will automatically be regarded as withdrawn by the applicant. There will be no reminder and no invitation. Confirmation of a designation consists of the filing of a notice specifying the designated State concerned (with an indication of the kind of protection or treatment desired) and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.

REQUIREMENTS REGARDING PRIORITY DOCUMENTS

For applicants who have not yet complied with the requirements regarding priority documents the following is recalled.

Where the priority of an earlier national (i.e., national or regional) application is claimed, the applicant must submit a copy of the said national application, certified by the authority with which it was filed ("the priority document") to the receiving Office (which will transmit it to the International Bureau) or directly to the International Bureau, before the expiration of 16 months from the priority date (Rule 17.1).

Where the priority document is issued by the receiving Office, the applicant may, instead of submitting the priority document, request the receiving Office to prepare and transmit the priority document to the International Bureau. Such a request must be made before the expiration of the 16-month time limit.

It is recalled that, where several priorities are claimed, the priority date to be considered for the purposes of computing the 16-month time limit is the filing date of the earliest application whose priority is claimed.

If the priority document concerned is not submitted to the International Bureau before the expiration of the 16-month time limit, or if the request to the receiving Office to transmit the priority document has not been made (and the corresponding fee, if any, paid) before the expiration of this time limit, any designated State may disregard the priority claim.

From the RECEIVING OFFICE

PCT

To:

Modiano, Guido
MODIANO & ASSOCIATI
Via Meravigli 16
20123 MILANO
ITALIE

**NOTIFICATION OF THE INTERNATIONAL
APPLICATION NUMBER AND OF THE
INTERNATIONAL FILING DATE**

(PCT Rule 20.5(c))

Date of mailing
(day/month/year)

17. 03. 94

Applicant's or agent's file reference

26240/GM/sd

IMPORTANT NOTIFICATION

International application No.

PCT/ EP 94/ 00493

International filing date (day/month/year)

21/02/1994

Priority date (day/month/year)

23/02/1993

Applicant

SIDERGAS S.r.l.

Title of the invention

1. The applicant is hereby notified that the international application has been accorded the international application number and the international filing date indicated above.
2. The applicant is further notified that the record copy of the international application was transmitted to the International Bureau on the above date of mailing.
3. ☐ Other:

* The International Bureau monitors the transmittal of the record copy by the receiving Office and will notify the applicant (with Form PCT/IB/301) of its receipt. Should the record copy not have been received by the expiration of 14 months from the priority date, the International Bureau will notify the applicant (Rule 22.1(c)).

Name and mailing address of the receiving Office



European Patent Office, P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

RLR

RLR. PETHER

PCT

REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only	
International Application No.	PCT/EP 94/00493
International Filing Date	21 FEB 1994 (21.02.94)
EUROPEAN PATENT OFFICE PCT INTERNATIONAL APPLICATION Name of receiving Office and "PCT International Application"	
Applicant's or agent's file reference (if desired) (12 characters maximum)	26240/GM/sd

Box No. I TITLE OF INVENTION	
CONTAINER FOR PACKAGING AND UNWINDING A COIL OF WIRE	
Box No. II APPLICANT	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)	<input type="checkbox"/> This person is also inventor. Telephone No. Facsimile No. Teleprinter No.
SIDERGAS S.r.l. Viale Rimembranza, 17 37010 S. AMBROGIO DI VALPOLICELLA (Province of Verona) ITALY	
State (i.e. country) of nationality: ITALY	State (i.e. country) of residence: ITALY
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input checked="" type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
Box No. III FURTHER APPLICANTS AND/OR (FURTHER) INVENTORS	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)	This person is:
GELMETTI Carlo Via Sagramuse, 48 37017 LAZISE (Province of Verona) ITALY	<input type="checkbox"/> applicant only <input checked="" type="checkbox"/> applicant and inventor <input type="checkbox"/> inventor only (If this check-box is marked, do not fill in below.)
State (i.e. country) of nationality: ITALY	State (i.e. country) of residence: ITALY
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input checked="" type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)	This person is:
	<input type="checkbox"/> applicant only <input type="checkbox"/> applicant and inventor <input type="checkbox"/> inventor only (If this check-box is marked, do not fill in below.)
State (i.e. country) of nationality:	State (i.e. country) of residence:
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
<input type="checkbox"/> Further applicants and/or (further) inventors are indicated on a continuation sheet.	

Box No. IV AGENT OR COMMON REPRESENTATIVE: OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:

☒ agent☐ common representative

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

MODIANO Guido
c/o MODIANO & ASSOCIATI
Via Meravigli, 16
20123 MILANO - ITALY

Telephone No.

(00392) 86.92.442

Facsimile No.

(00392) 86.38.60

Teleprinter No.

☐ Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

Box No. V DESIGNATION OF STATES

The following designations are hereby made under Rule 4.9(a) *(mark the applicable check-boxes; at least one must be marked)*:

Regional Patent

☒ EP European Patent: AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, DE Germany, DK Denmark, ES Spain, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT

☐ OA OAPI Patent: Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Congo, Côte d'Ivoire, Gabon, Guinea, Mali, Mauritania, Niger, Senegal, Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT *(if other kind of protection or treatment desired, specify on dotted line)*

National Patent *(if other kind of protection or treatment desired, specify on dotted line)*:☐ AT Austria☐ AU Australia☐ BB Barbados☐ BG Bulgaria☐ BR Brazil☐ BY Belarus☒ CA Canada☐ CH and LI Switzerland and Liechtenstein☐ CZ Czech Republic☐ DE Germany☐ DK Denmark☐ ES Spain☐ FI Finland☐ GB United Kingdom☐ HU Hungary☐ JP Japan☐ KP Democratic People's Republic of Korea☐ KR Republic of Korea☐ KZ Kazakhstan☐ LK Sri Lanka☐ LU Luxembourg☐ MG Madagascar☐ MN Mongolia☐ MW Malawi☐ NL Netherlands☐ NO Norway☐ NZ New Zealand☐ PL Poland☐ PT Portugal☐ RO Romania☐ RU Russian Federation☐ SD Sudan☐ SE Sweden☐ SK Slovakia☐ UA Ukraine☒ US United States of America☐ VN Viet Nam

Check-boxes reserved for designating States (for the purposes of a national patent) which have become party to the PCT after issuance of this sheet:

☐☐☐☐

In addition to the designations made above, the applicant also makes under Rule 4.9(b) all designations which would be permitted under the PCT except the designation(s) of _____

The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. *(Confirmation of a designation consists of the filing of a notice specifying that designation and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.)*

Box No. VI PRIORITY CLAIM

Further priority claims are indicated in the Supplemental Box ☐

The priority of the following earlier application(s) is hereby claimed:

Country (in which, or for which, the application was filed)	Filing Date (day/month/year)	Application No.	Office of filing (only for regional or international application)
item (1) ITALY	(23. 02. 93) 23 FEBRUARY 1993	VR93 U 000008	
item (2)			
item (3)			

Mark the following check-box if the certified copy of the earlier application is to be issued by the Office which for the purposes of the present international application is the receiving Office (a fee may be required):

☐ The receiving Office is hereby requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) identified above as item(s) : _____

Box No. VII EARLIER SEARCH

Fill in where a search (international, international-type or other) by the International Searching Authority has already been carried out or requested and the Authority is now requested to base the international search, to the extent possible, on the results of that earlier search. Identify such search or request either by reference to the relevant application (or the translation thereof) or by reference to the search request:

Country (or regional Office):

Date (day/month/year):

Number:

Box No. VIII CHECK LIST

This international application contains the following number of sheets:

1. request : 3 sheets
 2. description : 8 sheets
 3. claims : 2 sheets
 4. abstract : 1 sheets
 5. drawings : 6 sheets

Total : 20 sheets

This international application is accompanied by the item(s) marked below:

1. ☒ separate signed powers of attorney (two) 5. ☐ fee calculation sheet
 2. ☐ copy of general power of attorney 6. ☐ separate indications concerning deposited microorganisms
 3. ☐ statement explaining lack of signature 7. ☐ nucleotide and/or amino acid sequence listing (diskette)
 4. ☐ priority document(s) identified in Box No. VI as item(s): 8. ☒ other (specify): **designation of Inventor**

Figure No. 3 of the drawings (if any) should accompany the abstract when it is published.

Box No. IX SIGNATURE OF APPLICANT OR AGENT

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).

Milan, Italy

MODIANO Guido

February 18, 1994



For receiving Office use only

1. Date of actual receipt of the purported international application:	21 FEB 1994 (21. 02. 1994)	2. Drawings: <input checked="" type="checkbox"/> received: <input type="checkbox"/> not received:
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:		
4. Date of timely receipt of the required corrections under PCT Article 11(2):		
5. International Searching Authority specified by the applicant: ISA /	6. <input checked="" type="checkbox"/> Transmittal of search copy delayed until search fee is paid	

For International Bureau use only

Date of receipt of the record copy by the International Bureau:

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

10

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT OR THE DECLARATION

(PCT Rule 44.1)

To:

MODIANO & ASSOCIATI
Attn. Modiano, Guido
Via Meravigli 16
20123 MILANO
ITALY

Date of mailing
(day/month/year)

24/06/94

Applicant's or agent's file reference

26240/GM/sd

FOR FURTHER ACTION

See paragraphs 1 and 4 below

International application No.

PCT/EP 94/00493

International filing date
(day/month/year)

21/02/94

Applicant

SIDERGAS S.r.l. et al.

1. ☒ The applicant is hereby notified that the international search report has been established and is transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the international search report; however, for more details, see the notes on the accompanying sheet.

Where? To the International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Facsimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. ☐ With regard to the protest against payment of (an) additional fee(s) under Rule 40.2; the applicant is notified that:
- ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicants's request to forward the texts of both the protest and the decision thereon to the designated Offices.

- ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

Within 19 months from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within 20 months from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the International Searching Authority



European Patent Office, P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

C.D. v.d. Vliet

NOTES TO FORM PCT/ISA/220

These notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty and of the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the PCT Applicant's Guide, a publication of WIPO.

In these notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT administrative Instructions respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only.

What parts of the international application may be amended?

The claims only.

The description and the drawings may only be amended during international preliminary examination under Chapter II.

When?

Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confounded with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- (i) the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

NOTES TO FORM PCT/ISA/220 (continued)

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; Claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 TO 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings which cannot be amended under Article 19(1).

The statement will be published with the international application and the amended claims.

The statement should be brief, it should not exceed 500 words if in English or if translated into English.

It should not be confounded with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It should not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

In what language?

The amendments must be made in the language in which the international application is published. The letter and any statement accompanying the amendments must be in the same language as the international application if that language is English or French; otherwise, it must be in English or French, at the choice of the applicant.

Consequence if a demand for international preliminary examination has already been filed?

If, at the time of filing any amendments under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the same time of filing the amendments with the International Bureau, also file a copy of such amendments with the International Preliminary Examining Authority (see Rule 62.2(a), first sentence).

Consequence with regard to translation of the international application for entry into the national phase?

The applicant's attention is drawn to the fact that, where upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 26240/GM/sd	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> FOR FURTHER ACTION </div> <div style="width: 55%; font-size: small;"> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below. </div> </div>
International application No. PCT/EP 94/00493	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> International filing date (<i>day/month/year</i>) 21 February 1994 </div> <div style="width: 55%;"> (Earliest) Priority Date (<i>day/month/year</i>) 23 February 1993 </div> </div>
Applicant SIDERGAS S.r.l. et al	

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. ☐ Certain claims were found unsearchable (See Box I).

2. ☐ Unity of invention is lacking (See Box II).

3. ☐ The international application contains disclosure of a nucleotide and/or amino acid sequence listing and the international search was carried out on the basis of the sequence listing

☐ filed with the international application.
☐ furnished by the applicant separately from the international application,

☐ but not accompanied by a statement to the effect that it did not include matter going beyond the disclosure in the international application as filed.

☐ transcribed by this Authority.

4. With regard to the title, ☒ the text is approved as submitted by the applicant.
☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

☒ the text is approved as submitted by the applicant.
☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is:

Figure No. 3

☒ as suggested by the applicant.

☐ None of the figures.

☐ because the applicant failed to suggest a figure.
☐ because this figure better characterizes the invention.

A. CLASSIFICATION OF SUBJECT MATTER

IPC 5: B65D 85/04, B65H 49/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 5: B65D, B65H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI, CLAIMS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US, A, 1640368 (G.U. OBETZ ET AL), 30 August 1927 (30.08.27), page 2, line 12 - page 4, line 12, figures 1,3,9	1,7
Y	US, A, 4869367 (KAWASAKI ET AL.), 26 Sept 1989 (26.09.89), column 2, line 65 - column 3, line 15, figures 1,2,3	1,7
A	WO, A1, 8810230 (BRITISH TELECOMMUNICATIONS PLC), 29 December 1988 (29.12.88), figure 4, abstract	6

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance.
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

8 June 1994

Date of mailing of the international search report

24. 06. 94

Name and mailing address of the International Searching Authority/Authorized officer



European Patent Office, P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk
Tel (+31-70) 340-2040, Tx 31 651 epo nl
Fax (+31-70) 340-3016

Kerstin Hällgren

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US, A, 5105943 (LESKO ET AL.), 21 April 1992 (21.04.92), figures 1,2, abstract --	1-9
A	WO, A1, 8103319 (SKALTEK AB), 26 November 1981 (26.11.81), figure 8, abstract --	1-9
A	EP, A1, 0480259 (ALSTERMO KABEL AB), 15 April 1992 (15.04.92), figures 1,3, abstract -- -----	1-9

INTERNATIONAL SEARCH REPORT
Information on patent family members

86403

07/05/94

International application No.

PCT/EP 94/00493

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
US-A-	1640368	30/08/27	NONE		
US-A-	4869367	26/09/89	CA-A-	1169390	19/06/84
			DE-A,C-	3151803	12/08/82
			JP-C-	1437447	25/04/88
			JP-A-	57166269	13/10/82
			JP-B-	62046464	02/10/87
			JP-A-	57168241	16/10/82
			JP-A-	57198741	06/12/82
WO-A1-	8810230	29/12/88	AU-B-	632254	17/12/92
			AU-A-	1947788	19/01/89
			AU-A-	7200291	16/05/91
			CA-A-	1327558	08/03/94
			DE-A-	3868994	16/04/92
			EP-A,B-	0296860	28/12/88
US-A-	5105943	21/04/92	NONE		
WO-A1-	8103319	26/11/81	AT-E,T-	10731	15/12/84
			EP-A,B-	0052111	26/05/82
			SE-B,C-	446717	06/10/86
			SE-A-	8003826	22/11/81
			US-A-	4616469	14/10/86
EP-A1-	0480259	15/04/92	NONE		

PARENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 26240/GM/sd	<div style="display: flex; justify-content: space-between;"> <div style="text-align: center;">FOR FURTHER ACTION</div> <div style="font-size: small;">see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.</div> </div>	
International application No. PCT/EP 94/00493	International filing date (<i>day/month/year</i>) 21 February 1994	(Earliest) Priority Date (<i>day/month/year</i>) 23 February 1993
Applicant SIDERGAS S.r.l. et al		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. ☐ Certain claims were found unsearchable (See Box I).

2. ☐ Unity of invention is lacking (See Box II).

3. ☐ The international application contains disclosure of a nucleotide and/or amino acid sequence listing and the international search was carried out on the basis of the sequence listing

☐ filed with the international application.
☐ furnished by the applicant separately from the international application,

☐ but not accompanied by a statement to the effect that it did not include matter going beyond the disclosure in the international application as filed.

☐ transcribed by this Authority.

4. With regard to the title, ☒ the text is approved as submitted by the applicant.
☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

☒ the text is approved as submitted by the applicant.
☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is:

Figure No. 3

☒ as suggested by the applicant.
☐ because the applicant failed to suggest a figure.
☐ because this figure better characterizes the invention.

☐ None of the figures.

A. CLASSIFICATION OF SUBJECT MATTER

IPC 5: B65D 85/04, B65H 49/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 5: B65D, B65H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI, CLAIMS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Y	US, A, 1640368 (G.U. OBETZ ET AL), 30 August 1927 (30.08.27), page 2, line 12 - page 4, line 12, figures 1,3,9 --	1,7
Y	US, A, 4869367 (KAWASAKI ET AL.), 26 Sept 1989 (26.09.89), column 2, line 65 - column 3, line 15, figures 1,2,3 --	1,7
A	WO, A1, 8810230 (BRITISH TELECOMMUNICATIONS PLC), 29 December 1988 (29.12.88), figure 4, abstract --	6

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
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"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

8 June 1994

Date of mailing of the international search report

24.06.94

Name and mailing address of the International Searching Authority/Authorized officer



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Fax (+31-70) 340-3016

Kerstin Hällgren

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP 94/00493

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US, A, 5105943 (LESKO ET AL.), 21 April 1992 (21.04.92), figures 1,2, abstract --	1-9
A	WO, A1, 8103319 (SKALTEK AB), 26 November 1981 (26.11.81), figure 8, abstract --	1-9
A	EP, A1, 0480259 (ALSTERMO KABEL AB), 15 April 1992 (15.04.92), figures 1,3, abstract -- -----	1-9

INTERNATIONAL SEARCH REPORT
Information on patent family members

86403

07/05/94

International application No.

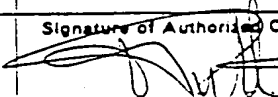
PCT/EP 94/00493

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
US-A-	1640368	30/08/27	NONE		
US-A-	4869367	26/09/89	CA-A-	1169390	19/06/84
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			JP-C-	1437447	25/04/88
			JP-A-	57166269	13/10/82
			JP-B-	62046464	02/10/87
			JP-A-	57168241	16/10/82
			JP-A-	57198741	06/12/82
WO-A1-	8810230	29/12/88	AU-B-	632254	17/12/92
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			DE-A-	3868994	16/04/92
			EP-A,B-	0296860	28/12/88
US-A-	5105943	21/04/92	NONE		
WO-A1-	8103319	26/11/81	AT-E,T-	10731	15/12/84
			EP-A,B-	0052111	26/05/82
			SE-B,C-	446717	06/10/86
			SE-A-	8003826	22/11/81
			US-A-	4616469	14/10/86
EP-A1-	0480259	15/04/92	NONE		

INTERNATIONAL SEARCH REPORT

International Application No PCT/GB 88/00488

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) *		
According to International Patent Classification (IPC) or to both National Classification and IPC		
IPC ⁴ : B 65 H 54/80; B 65 H 49/08; G 02 B 6/44		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
IPC ⁴	B 65 H; G 02 B	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched *		
III. DOCUMENTS CONSIDERED TO BE RELEVANT ⁹		
Category *	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
X	FR, A, 1581707 (L. BEKAERT) 19 September 1969, see claims; figures	1, 3, 5, 6
A	--	2, 4, 7, 8
A	US, A, 2929577 (G.E. HENNING) 22 March 1960, see claims; figures	1
A	--	
A	EP, A, 0039140 (AEIL) 4 November 1981, see abstract	1
A	--	
A	DE, A, 2202177 (KABEL + METALLWERKE) 26 July 1973, see claims; figures	1
A	--	
A	FR, A, 2552890 (M. LEVY) 5 April 1985, see abstract; figure	1
A	--	
A	EP, A, 0102077 (I.S.E.C.) 7 March 1984, see abstract	1
A	--	
A	EP, A, 0108590 (B.T.) 16 May 1984, see abstract	1

<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>* Special categories of cited documents: ¹⁰</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&" document member of the same patent family</p> </div> </div>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
15th September 1988	07. 10. 88	
International Searching Authority	Signature of Authorized Officer	
EUROPEAN PATENT OFFICE	 P.C.G. VAN DER PUTTEN	

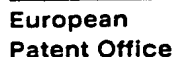
ANNEX TO THE INTERNATIONAL SEARCH REPORT ON INTERNATIONAL PATENT APPLICATION NO.

GB 8800488

SA 22893

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 28/09/88. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR-A- 1581707	19-09-69	None	
US-A- 2929577		US-A- 2929576	
EP-A- 0039140	04-11-81	GB-A- 2074132	28-10-81
DE-A- 2202177	26-07-73	None	
FR-A- 2552890	05-04-85	None	
EP-A- 0102077	07-03-84	US-A- 4453635	12-06-84
EP-A- 0108590	16-05-84	AU-A- 2102883	17-05-84
		JP-A- 59104607	16-06-84
		EP-A- 0186753	09-07-86
		US-A- 4691896	08-09-87



EUROPEAN SEARCH REPORT

Application Number

EP 91 11 6494

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
Y A	US-A-2 943 732 (J.J. KOVALESKI ET AL.) (* column 2, line 13 - line 69; figures 5,10,11 *) - - -	1-3.5.7.8 4,6	B 65 D 85/04
Y	AT-B-388 357 (ROSENDAHL MASCHINEN GMBH) * page 2, line 18 - line 30 ** - - -	1-3.5.7.8	
D,A	DE-A-3 703 018 (HUBER & DROTT) * column 4, line 61 - column 5, line 16; figures 1,6 ** - - - - -	6	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int. Cl.5) B 65 D B 65 H
Place of search The Hague		Date of completion of search 27 January 92	Examiner SMOLDERS R.C.H.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

2
INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP 94/00493

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US, A, 5105943 (LESKO ET AL.), 21 April 1992 (21.04.92), figures 1,2, abstract --	1-9
A	WO, A1, 8103319 (SKALTEK AB), 26 November 1981 (26.11.81), figure 8, abstract --	1-9
A	EP, A1, 0480259 (ALSTERMO KABEL AB), 15 April 1992 (15.04.92), figures 1,3, abstract -- -----	1-9

INTERNATIONAL SEARCH REPORT

International application No.

PCT/94/00493

A. CLASSIFICATION OF SUBJECT MATTER

IPC 5: B65D 85/04, B65H 49/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 5: B65D, B65H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI, CLAIMS

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A	WO, A1, 8810230 (BRITISH TELECOMMUNICATIONS PLC), 29 December 1988 (29.12.88), figure 4, abstract --	6

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Date of the actual completion of the international search

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8 June 1994

24.06.94

Name and mailing address of the International Searching Authority/Authorized officer



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Fax (+31-70) 340-3016

Kerstin Hällgren

INTERNATIONAL SEARCH REPORT
 Information on patent family members

07/05/94

 International application No.
 PCT/EP 94/00493

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US-A-	1640368	30/08/87	NONE	
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			DE-A, C- 3151803	12/08/82
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			JP-A- 57166269	13/10/82
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WO-A1-	8810230	29/12/88	AU-B- 632254	17/12/92
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			US-A- 4616469	14/10/86
EP-A1-	0480259	15/04/92	NONE	

INTERNATIONAL SEARCH REPORT

International application No.

PCT/E 94/00493

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Kerstin Hällgren

2
INTERNATIONAL SEARCH REPORT

International application No.

PCT/ 94/00493

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07/05/94

 International application No.
 PCT/EP 94/00493

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			JP-A-	57198741	06/12/82
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WO-A1-	8103319	26/11/81	AT-E,T-	10731	15/12/84
			EP-A,B-	0052111	26/05/82
			SE-B,C-	446717	06/10/86
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